



Extension

UNIVERSITY OF WISCONSIN-MADISON

Wisconsin Purple Loosestrife Biocontrol Program Updates

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Natural Resources Institute/WDNR

4/3/2020 – WI Lakes and Rivers Convention

My Goals For Today

- Status during Covid-19
- A bit of history and how to
- Changes/updates
- Looking for the data gaps

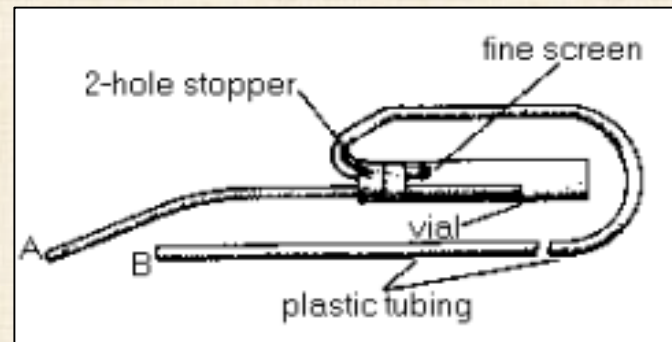
My Goals Going Forward

- Find new partners
- More coordination for our efforts
- Bring data up-to-date for evaluation and analysis and new research

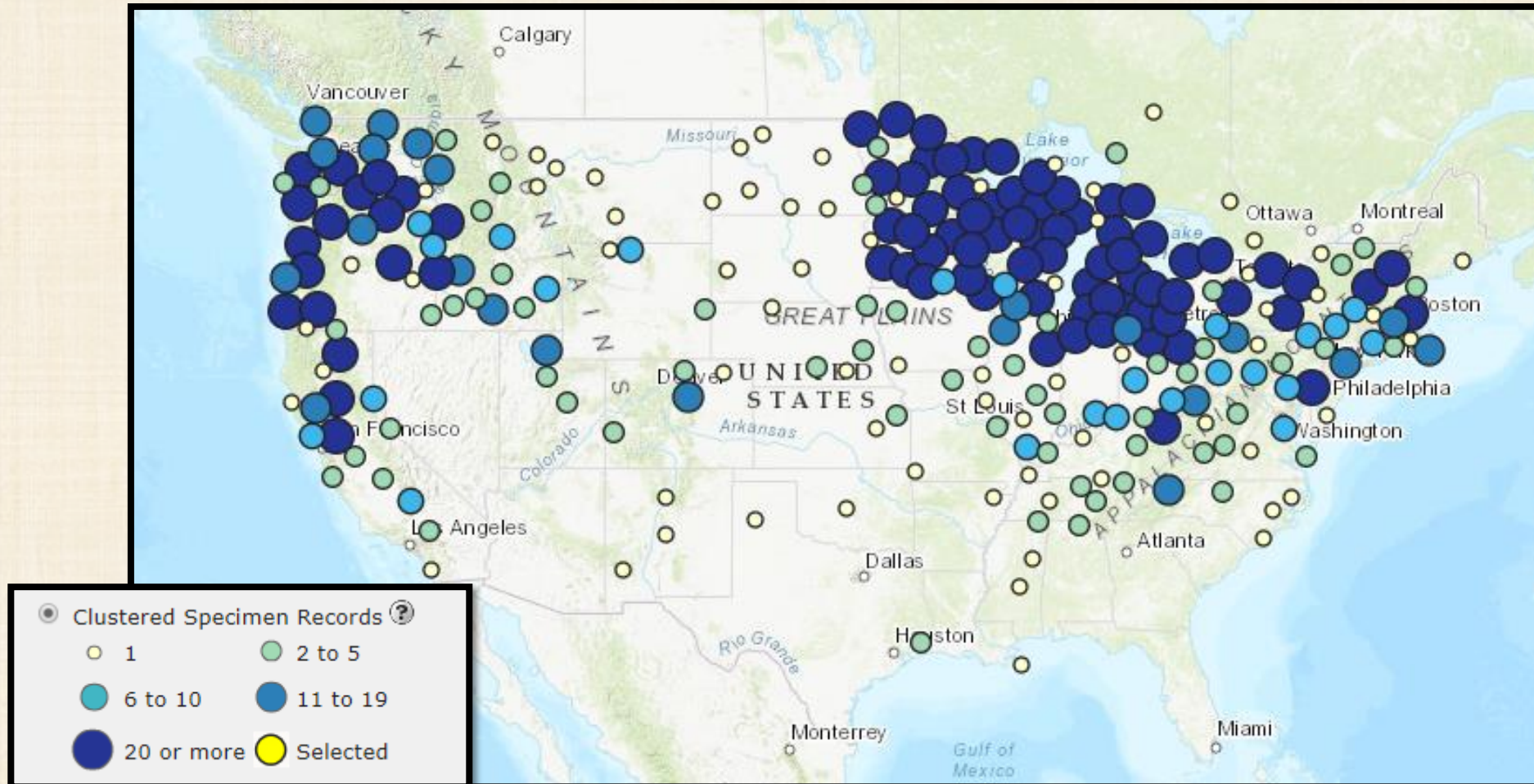


Purple Loosestrife Biocontrol during Covid-19

- Carrying on! But with limits...
 - Netting can't be mailed until non-essential travel ban is lifted
 - Digs should be extremely limited and done only with household members
 - Beetles-the hardest part!
 - Beetles cannot be sent between partners or from the coordinator due to the degree of handling and blowing into the storage bags to give the beetles air.
 - If you can collect your own beetles, that is best and safest. Use small ziplock bags to collect just what you need for each plant. Or if you have an aspirator, use the aspirator to catch the beetles and put them in your bags or vials.



Not just Wisconsin's problem



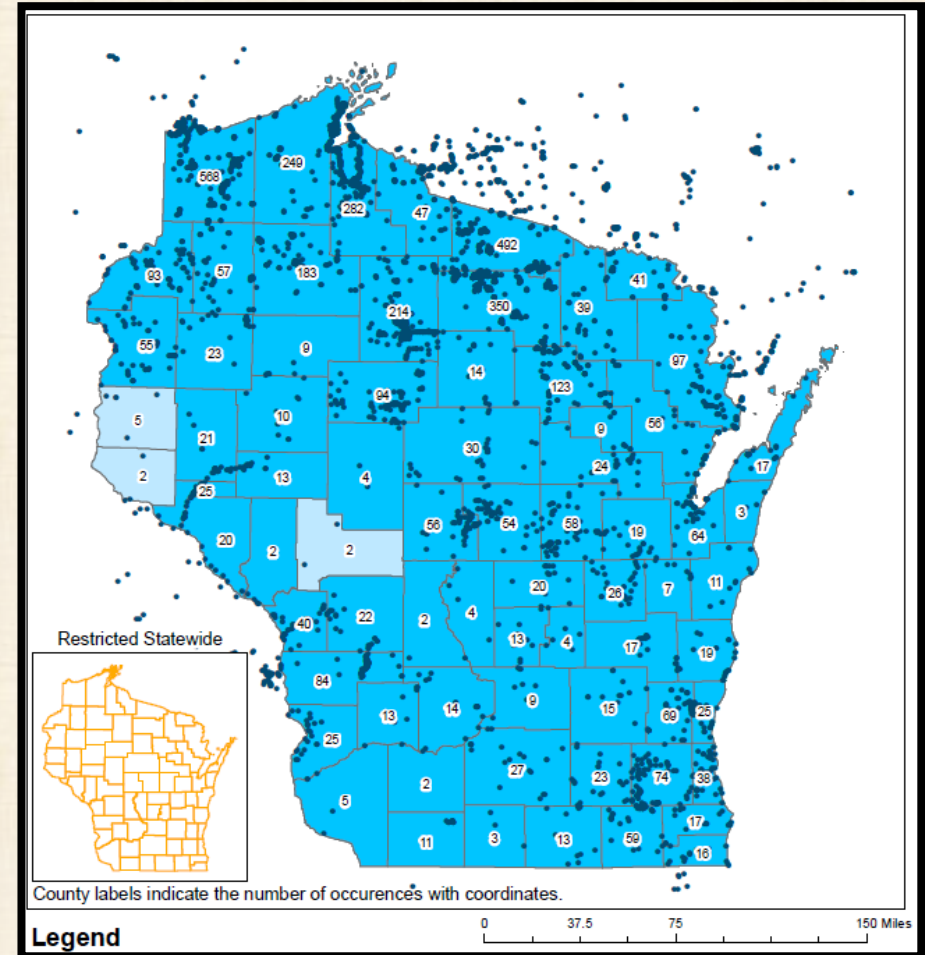
2/17/2020 Nonindigenous Invasive Species (NAS-USGS) Purple Loosestrife (*Lythrum salicaria*)

Purple loosestrife in every county

- WDNR Invasive Species Archive



Apple River-Katie Holm 2014



Need drove the program's development

Brock Woods
Mid 1990s—As a DNR LTE he researched the efficacy and safety of 2 species of *Galerucella* beetles and two other species.



1998 – Brock began the Purple Loosestrife Biocontrol Program used by DNR staff, partners and volunteers
2002-2019 Brock managed the program as a full time UW Extension contractor with WDNR

Answering the Call!

- Partners

- DNR staff
- County Staff and volunteers
- Tribal partners, such as GLIFWC
- Individual volunteers
- AIS Partner staff and volunteers
- Cooperative Weed Management or Cooperative Invasive Species Management groups and volunteers
- FERC Staff
- School groups-all levels
- Scout groups
- 4-H groups
- Master Gardeners and Master Naturalists
- Lake Associations and Districts
- City organizations and volunteers
- Wetlands Associations
- Nature Centers
- RC&Ds
- No doubt I missed someone!

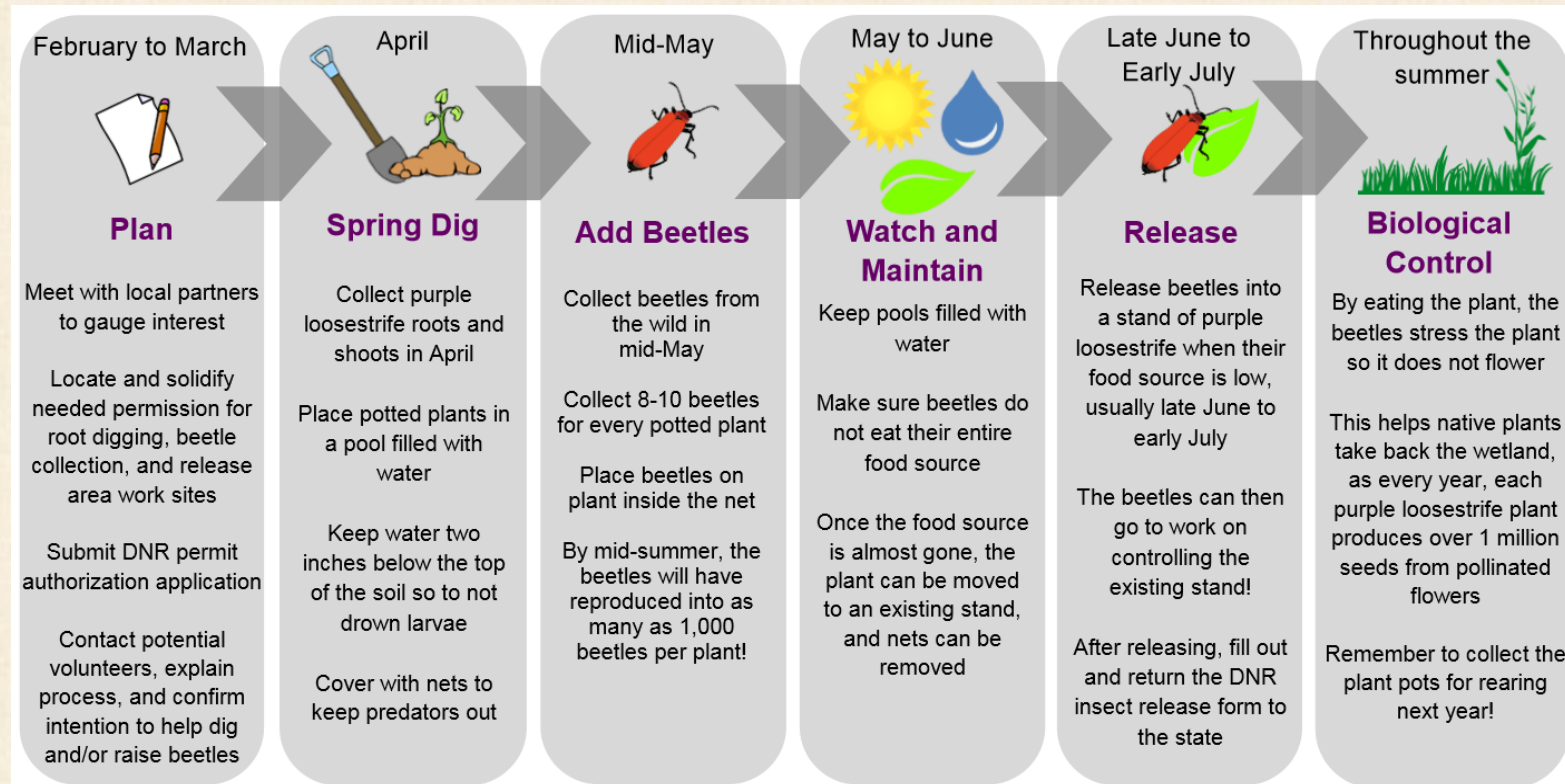
- **WDNR's SWIMS Database**

- 1310 records of individuals and organizations who were trained and/or participated in biocontrol projects
- **1999 to 2011 historic paper file review**
 - 263 individual records
- Some active since 2002, possibly earlier!



John and Delores Klingberg-helped me with my first purple loosestrife biocontrol project at Rome Pond, Jefferson County

Purple Loosestrife Biocontrol Basics



Graphic provided by Golden Sands Resource Conservation & Development Council, Inc., member of the Wisconsin Aquatic Invasive Species Partnership

Purple Loosestrife Biocontrol Basics



Dig root stock



Pot the plants and set up pools or mass rearing cages



Once the plants are about 2' tall add field captured beetles



Beetles mate and lay eggs; the larvae eat and grow into new adults



The larvae or new adults are ready!



The plants and beetles are returned to the wetland, lake edges, ditches...

Required

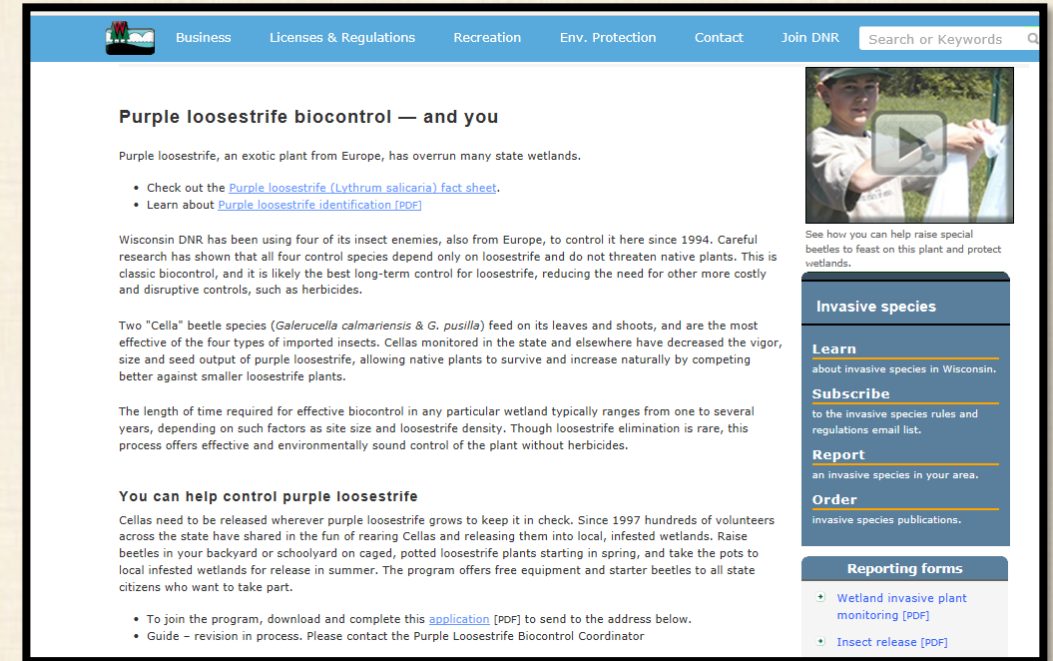
Purple loosestrife is an NR40 Restricted species and can't be moved from place to place without a permit. There are two required forms for biocontrol.

1. Application

- Let's us know who is participating and needs supplies
- Acts as a permit request

2. Beetle Release form

- Permit requirement



The screenshot shows the Wisconsin DNR website page for Purple Loosestrife Biocontrol. The page has a blue header with navigation links: Business, Licenses & Regulations, Recreation, Env. Protection, Contact, and Join DNR. A search bar is located in the top right corner. The main content area is titled "Purple loosestrife biocontrol — and you" and includes the following text:

Purple loosestrife, an exotic plant from Europe, has overrun many state wetlands.

- Check out the [Purple loosestrife \(Lythrum salicaria\) fact sheet](#).
- Learn about [Purple loosestrife identification \[PDF\]](#)

Wisconsin DNR has been using four of its insect enemies, also from Europe, to control it here since 1994. Careful research has shown that all four control species depend only on loosestrife and do not threaten native plants. This is classic biocontrol, and it is likely the best long-term control for loosestrife, reducing the need for other more costly and disruptive controls, such as herbicides.

Two "Cella" beetle species (*Galerucella calmariensis* & *G. pusilla*) feed on its leaves and shoots, and are the most effective of the four types of imported insects. Cellas monitored in the state and elsewhere have decreased the vigor, size and seed output of purple loosestrife, allowing native plants to survive and increase naturally by competing better against smaller loosestrife plants.

The length of time required for effective biocontrol in any particular wetland typically ranges from one to several years, depending on such factors as site size and loosestrife density. Though loosestrife elimination is rare, this process offers effective and environmentally sound control of the plant without herbicides.

You can help control purple loosestrife

Cellas need to be released wherever purple loosestrife grows to keep it in check. Since 1997 hundreds of volunteers across the state have shared in the fun of rearing Cellas and releasing them into local, infested wetlands. Raise beetles in your backyard or schoolyard on caged, potted loosestrife plants starting in spring, and take the pots to local infested wetlands for release in summer. The program offers free equipment and starter beetles to all state citizens who want to take part.

- To join the program, download and complete this [application \[PDF\]](#) to send to the address below.
- Guide – revision in process. Please contact the Purple Loosestrife Biocontrol Coordinator

On the right side of the page, there is a video player showing a person holding a white bag, with a play button overlay. Below the video is a sidebar with the following sections:

- Invasive species**
- Learn**
about invasive species in Wisconsin.
- Subscribe**
to the invasive species rules and regulations email list.
- Report**
an invasive species in your area.
- Order**
invasive species publications.
- Reporting forms**
 - [Wetland invasive plant monitoring \[PDF\]](#)
 - [Insect release \[PDF\]](#)

- Applications are available through DNRAISinfo@Wisconsin.gov or from the Purple Loosestrife Biocontrol webpage on the WDNR site

Changes

1. Application and Permit
 - New Application
 - A separate permit letter from the WDNR Statewide Monitoring Coordinator
2. Updated Guidance
 - Overview
 - How-to sections based by months you do the steps
 - Appendix items covering items such as the beetle life cycle, catching your own beetles, mass rearing cages and references
3. Update Beetle Release form
4. Update Site Revisit form

Wisconsin Purple Loosestrife Biocontrol Program Overview and Instructions

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Permit letter

- Formal look but no fundamental program changes
- Disinfection- needed as permittees
 - At the dig or release sites
 - Use water and brush first
 - Give all footwear and tools a spray of bleach solutions (2.44 tbl spoons per gallon of water OR let footwear and other gear dry for 5 or more days)
- Labeling in public locations
 - Working on getting plant sticks
 - A simple sign in growing areas

The species in this pot is purple loosestrife, a Chapter NR 40 restricted species. Purple Loosestrife Biocontrol Project approved by the Wisconsin Department of Natural Resources. To learn more, contact DNRAISinfo@wisconsin.gov or 608-266-0061.

Mini guide!



Quick Guide to Wisconsin Purple Loosestrife Biocontrol—February 2020



Galerucella californiensis
Black-margined loosestrife beetle
© Paul Skawinski 2014

Collecting your own beetles? Making a Beetle Trap



Making a beetle trap

- 20 oz and/or 2 liter bottles
 - Scissors or X-acto knife
 - Electrical tape
 - Cotton balls
 - Gallon-sized zippered plastic bags for field use
 - Cooler for field use
1. Discard the cap. Wash and dry the bottle.
 2. Cut the bottle off just below the point where it starts to become straight instead of curved. If you flip the cut-off top over and it just falls into the bottle, you've cut too high and will need to start with a new bottle.
 3. The inverted top should fit snugly. Use the electrical tape to secure the inverted top to the bottle. Electrical tape works best because it is easy to remove when you're ready to dump the beetles into a zippered plastic bag. Carefully smooth the tape so there are no gaps for beetles to escape.
 4. The cotton balls will be used as a stopper to keep the beetles in the trap.

Potting



- In a pool, spray wash just the top of the root ball with a garden hose to remove any eggs of plant or insect predators; bag the waste for the landfill
- In second pool, mix water and potting soil so it is thoroughly wet
- Add some soil to the bottom of the pot and place your roots on top, trimming the roots as necessary to fit; you want them to "just fit"
- Fill each pot with enough soil to allow the root crown to sit 2" below the top of the pot; if combining small roots, they should total 6-8 stems
- Pack the soil into any air pockets, but not too firmly; the larvae will need to penetrate the soil surface later
- If the soil does not have fertilizer, sprinkle slow release fertilizer (amount as shown for pot size) onto the soil and mix in about 1"
- Cage the plants with netting
 - Use duct tape or very snug bungee cords around the pot and bottom of the net; pots often have a bit of a lip that will help keep the net from slipping off; if using duct tape, keep it out of the water and be prepared to replace it if it gets loose
 - Close the top of the net with heavy twine or clothesline rope 5-6" from the top; wire may also work; you will open this end later to add beetles, but it needs to be tight enough to keep out predators like spiders
- The pools should be in an area with full sun and under the structure used to support the netting, but out of strong windy areas
- Place your pots in the pools; one pot (2 if the pool is large) can go in the middle and the rest around the pool side, but don't crowd them; airflow and sunlight need to reach the plants
- Tie the top of each net to the support, whether it's a clothes line or rope strung across another structure; the goal is to have the net tall enough (5-6' minimum) to give your plants maximum growing room and the beetles easy access around the plants
- Add water to the pools so that it comes to just under the drilled holes; remember the water level should stay 2" below the soil height for healthier pupating beetles.
- Expect the plants to grow 4-6 weeks and to a height of 1.5 feet before beetles are added

Tools Needed



Tribal partners for the Shishebogama/Gunlock Lakes Association

- **Decontamination tools** for footwear and tools, used when leaving wetlands
 - Hand held brushes
 - Jug(s) of water
 - **Digging**
 - Waders or high-topped boots for walking in wetlands (used for all wetland visits)
 - Shovels and/or pitchforks—pitchforks are excellent for getting intact roots
 - Hand shears for clipping when you collect roots
 - Extra-large garbage bags or large tubs for hauling roots
 - Optional-native seed to drop into the holes left by your dug root stock
 - **Potting and growing**
 - A sunny area near a water source for refilling pools
 - 2 to 5 gallon pots at least 12" across - often free from local garden centers or landscape companies
 - Wading pools - each should hold 4-6 pots without crowding the growing plants. Drill holes about 4-5" from the bottom for draining-the pool water should be 2" below the soil line of potted plants.
 - Potting soil with a fertilizer - about 2 cubic feet per 6 pots
 - Fertilizer if not in the soil
 - A sturdy frame: clothes line, fence posts or other method to keep the tops of the nets raised to at least 5-6 feet
 - Netting (1 net/pot)-provided by the statewide coordinator, but the long side is sewn by volunteer(s). *
 - Duct tape or bungee cords to secure net around the bottom of the pot
 - Cord, such as twine or fabric clothesline rope to tie top of net closed and secure to support
 - **Collecting beetles** (primarily by coordinators and individuals with access)
 - Aspirators and vials - available from statewide coordinator, if needed*
 - 2 liter bottles
 - Electrical tape
 - Cotton balls
 - Zippered bags
 - **Release**
 - Large garbage bags - for hauling out any flowers you cut, netting and pots
 - Flagging for pots left at release sites
- * No cost to cooperators: beetles, netting, aspirator, vials

Decentralizing

- **Statewide Coordinator**

- Primary contact for program information
- Provides overall program guidance and support
- Receives and tracks applications
- Supplies netting and aspirators
- Provides beetles but on a more limited basis
- Connects people to regional AIS Coordinators
- Manages program materials
- Supervises data management



- **Regional Coordinators**

- DNR or Partners (AIS Partnership, new Network Coordinators, CISMAs, etc.)
- Manage their own projects or supporting others locally
- Provide local support to individuals and groups
- Provide beetles

Data – pulling it together for evaluation, analysis, and other study

- **Potential areas of study**

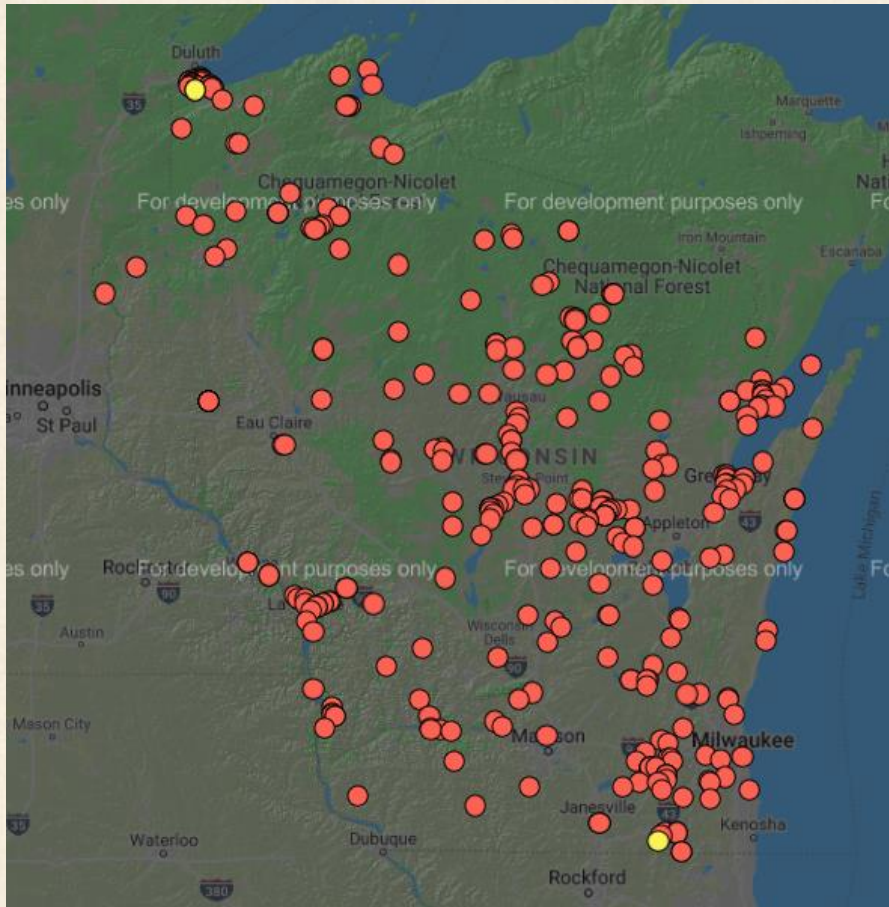
- A basic program evaluation and analysis
- Long-term effects of biocontrol—limited existing studies
- Use of purple loosestrife biocontrol records to assess and model effects of climate change on wetland invasive plants due to extreme rain, flooding, polar vortex occurrences late in winter and early spring

- **Issues to consider**

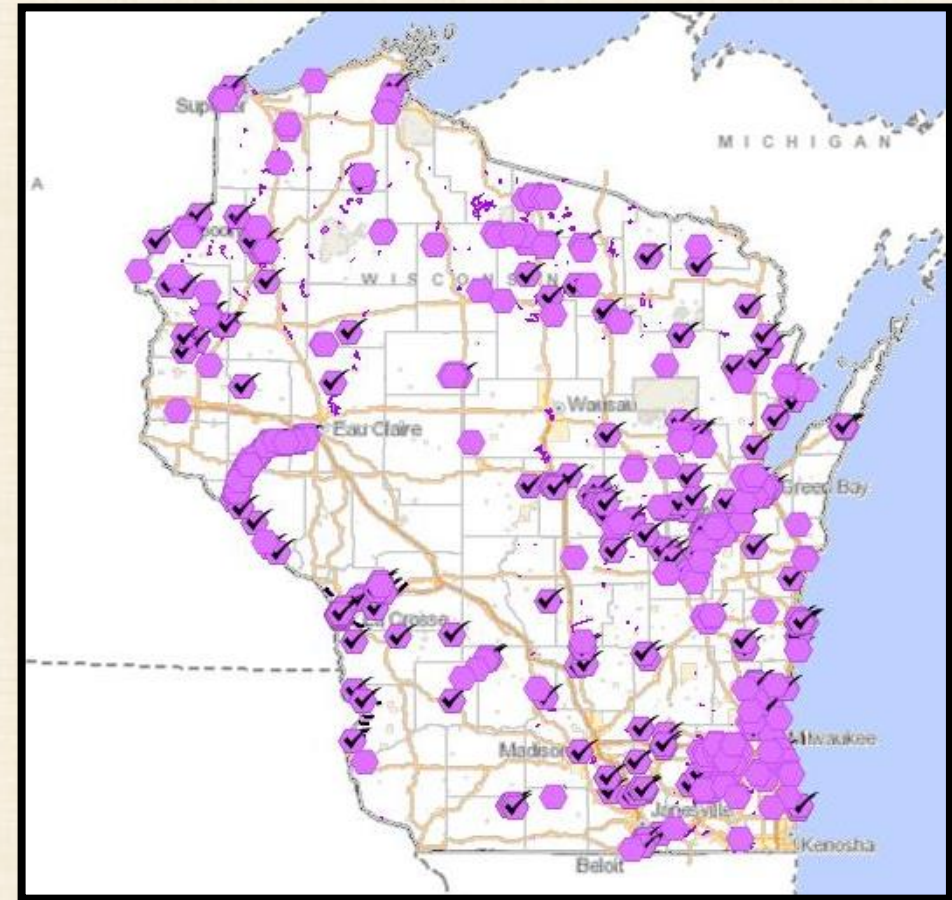
- Pre-2002 records mainly an email and ‘paper trail’; often only paper maps were available
- Site revisit (same year as release) records lacking
- Many sites need to be officially verified by WDNR
- Missing records from counties, researches
- Public lands records may not have been shared with monitoring staff

Wide Variability Between Maps

- Flora of Wisconsin



- WDNR Lakes and AIS Viewer



Why isn't everything on one map?

- Different organizations and goals for monitoring
 - A university project coordinator may have no idea DNR would like the records
- New reporting tools
 - A variety of apps that feed into different databases but not SWIMS (WDNR-Surface Water Integrated Monitoring System)
 - New mapping and data recording tools that don't "talk" to the SWIMS - yet
- WDNR verification needs may not have been met – only verified reports show up on the WDNR's Lakes and AIS Viewer for the general public

A long-term gap in information being filled

Program data not recognized as a type of monitoring data until recently

1. Application form: The root stock source is reported when known
2. Beetle release data form

Both forms include

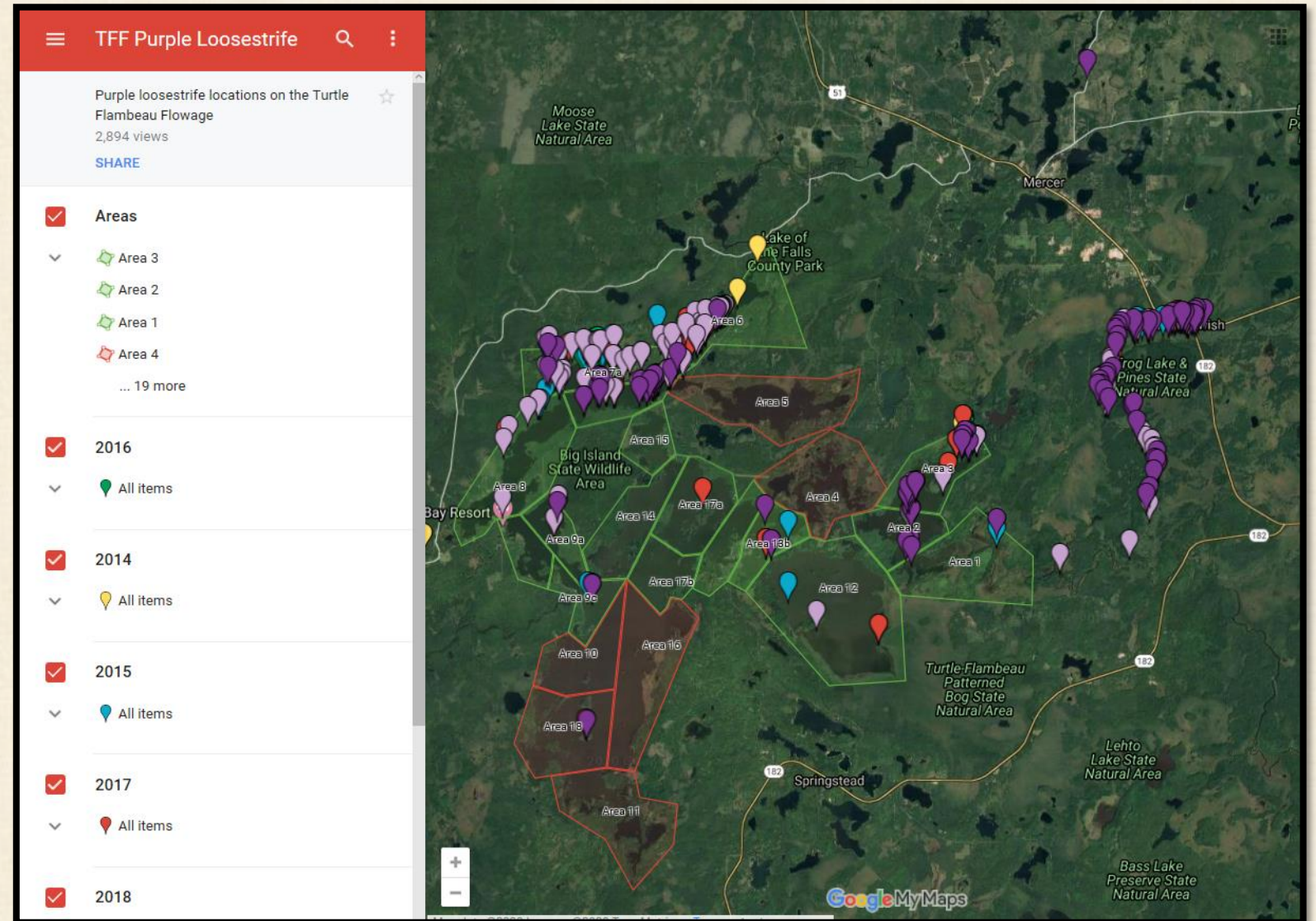
- Specific location
- Size of infestation

Source of Your Purple Loosestrife (PL) Plants		
<p>Purple loosestrife root stock and beetles should only be collected where landowner permission has been granted, including on public lands. If you know where you will collect root stock, complete the section below. If you do not know where you will dig your root stock, yet, please send the location information and a photo of purple loosestrife on site once you find it. If you are working with a coordinator who will find the root stock for you, they will provide the information.</p> <p>The purple loosestrife root digging location will be shared with your regional WDNR AIS Coordinator and entered into the SWIMS data base if it has not been reported and verified previously. A picture of the plants at the digging site will help complete the WDNR verification process and can be emailed or mailed with this application. Pictures can also be provided later to the same address, if they aren't available at the time of application. Photos can be of plants in any season.</p>		
County	Site name (if none, your suggestion)	Habitat: Wetland, Ditch, Lake shore, River shore, etc.
<input type="text"/>	<input type="text"/>	<input type="text"/>
Location Description (ex. NE corner of CTH K and Town Line Road or Next to Golden Pond boat launch)		
<input type="text"/>		
Latitude (decimal degrees)	Longitude (decimal degrees)	Station ID, if known
<input type="text"/>	<input type="text"/>	<input type="text"/>
Landowner Name (and phone number if known)		
<input type="text"/>		
Acreage of Purple Loosestrife (check one)		
<input type="radio"/> less than 1/2 acre <input type="radio"/> 1/2-1 acre <input type="radio"/> 1-10 acres <input type="radio"/> more than 10 acres		
Purple Loosestrife Coverage (circle one)		
<input type="radio"/> 0-25% <input type="radio"/> 26-50% <input type="radio"/> 51-75% <input type="radio"/> 76-100%		
If you have additional digging sites, please provide the information above on an additional sheet.		
Plant and beetle rearing site		
If the beetles are to be raised at an address/site that is different from the Applicant's mailing address, please provide the address.		
<input type="checkbox"/> This location uses a mass rearing cage(s) Number of mass rearing cages: <input type="text"/>		

Back of updated (2020)
program application

Great data in new forms

Iron County map with supporting spreadsheet- Staff and volunteer efforts included monitoring, rearing beetles and other management strategy



Burnett County - Trade River

Photo point records



Records in emails and reports have not always made it into the SWIMS reporting system
If you have old records you never sent to Brock Woods, please send to jeanne.scherer@wisc.edu or DNRAISInfo@Wisconsin.gov

TO: FEMS, Dave, Worms, Brad
Subject: RE: PL beetles

OK, All of a sudden we have tons of beetles, I've never seen them come on so sudden. We have been adding lots of extra PL, so I assume we have lots more beetles to emerge. We put a bunch out today at Memory Lake Park here in Grantsburg and will plan to release a bunch tomorrow at Dueholm Flowage. Then for the weekend, do you want some? I'm just making sure they get out and don't sit. I have limited sites for this year so if you have sites we have beetles. Thanks, Bob

Subject: RE: PL beetles

We put-out a bunch of beetles (3000) on Dueholm and are ready to share! We have new plants in the cage with nets around the base, ready to be closed. Let us know when you can get them. Bob

Crex Meadows Purple Loosestrife Report 2018

By: McKenna Hammons

Objectives

Control the invasive plant purple loosestrife (*Lythrum salicaria*) by using chemical and biological means.

Beetles

29 purple loosestrife plants were collected from Hanscom Lake in late May. These plants were replanted in pots and contained in an enclosure on Crex property.

55 Purple Loosestrife beetles (*Galerucella californiensis* and *G. pusilla*) were collected from Little Holmes Lake and Daniels Flowage in late June.

95 adults and 20 larvae were released at sites listed below in late July/early August.

Collection sites for plants and beetles came from the Burnett County Land Services Aquatic Invasive Species Coordinator.

Beetle Collection and Release Sites:

Daniels Flowage



2018 - Collected 25 beetles here, released 73 beetles here. Purple loosestrife plants depicted in purple.

Coordinates: 45.703935 N, -92.702661 W

2016 - Released 4 beetles along Hickerson Road, south of the water control structure.

926 W

Learn More!

- Training webinars
 - Wednesday, April 8: 1-2:30 pm and 6:30 to 8:00 pm
 - Same info at each time, so just choose one
 - Email Jeanne.scherer@wisc.edu for the links by Tuesday, April 7



The Purple Loosestrife Biocontrol Program is alive and well! (the purple loosestrife, not so much)



Questions?

Jeanne.scherer@wisc.edu

DNRAISinfo@wisconsin.gov

608-266-0061